



# Environmental Justice Technical Report

*For the C-470 Corridor  
Revised Environmental Assessment*

*July 2015*

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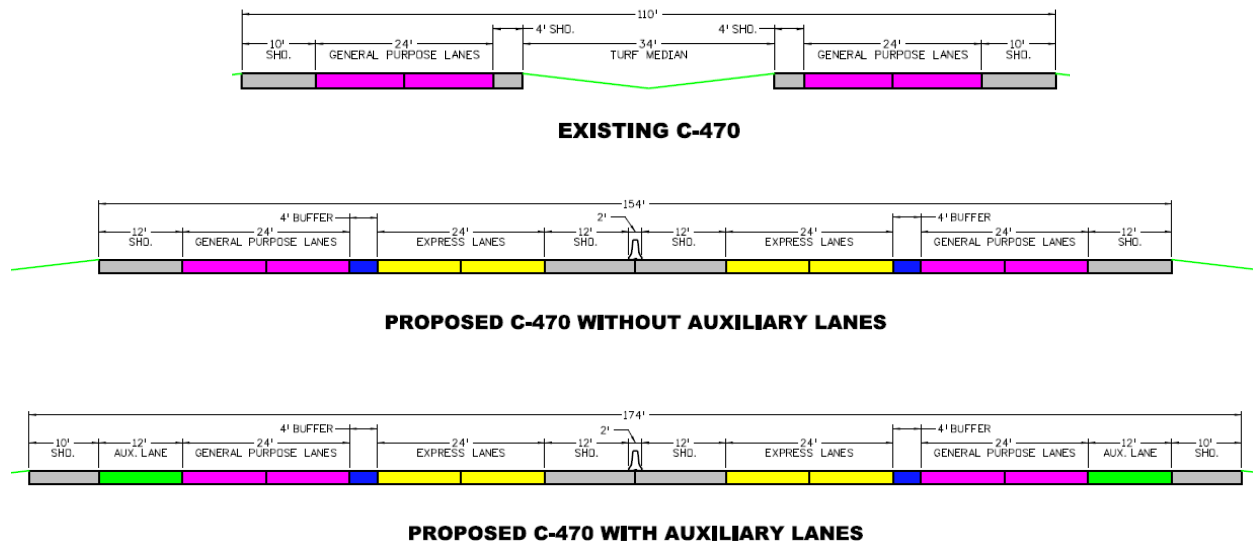
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C-470 is located about 13 miles south of downtown Denver. It passes through Arapahoe, Douglas, and Jefferson counties, as shown in Figure 1. In 2013, the Federal Highway Administration (FHWA) and Colorado Department of Transportation (CDOT) initiated a Revised Environmental Assessment (EA) for the 13-mile portion of C-470 between Kipling Parkway and Interstate 25 (I-25) to address congestion and delay, and to improve travel time reliability for C-470 users. The Proposed Action in the Revised EA differs slightly from the Express Lanes (EL) alternative identified in the previous EA that was approved by CDOT and FHWA in 2006.

The map illustrates the study area, which is a wavy red and yellow band running horizontally across the center. It is bounded by Ken Caryl Ave on the left and Dry Creek Rd on the right. The area is divided into several municipalities: Ken Caryl, Littleton, Centennial, Highlands Ranch, and Lone Tree. The map also shows the locations of Jefferson, Arapahoe, and Douglas counties. Major roads include I-70, I-25, and various local roads like Ken Caryl Ave, Platte Canyon Rd, and University Blvd. The map also shows the locations of Ken Caryl, Littleton, Centennial, Highlands Ranch, and Lone Tree.

The existing C-470 freeway includes two general purpose lanes in each direction with a depressed median, resulting in a typical cross section approximately 110 feet wide. This width expands near grade-separated interchanges to include off-ramps, on-ramps, and in some cases, auxiliary lanes. In the No-Action Alternative, this configuration would remain unchanged, but would receive maintenance as needed to maintain the safety and functionality of the existing four-lane freeway.

The Proposed Action would add two tolled Managed Express Lanes in each direction, expanding the four-lane freeway to an eight-lane freeway. To aid motorists in merging onto or off of the highway, auxiliary lanes will be provided between closely spaced interchanges (e.g., one mile apart). The typical cross section will vary from 154 feet without auxiliary lanes to 174 feet in areas with auxiliary lanes. The Proposed Action does not include any new interchanges or any major interchange modifications. The existing and proposed typical cross sections are shown below in Figure 2.

**Figure 2. Existing and Proposed C-470 Typical Cross Sections**

## 1.2 Environmental Justice Executive Order

As a part of the Revised EA, the project corridor was evaluated to determine the presence of minority and/or low-income populations and whether these populations might incur disproportionate high and adverse environmental impacts as a result of this project. This evaluation is called the environmental justice analysis.

In February 1994, President Clinton issued Executive Order 12898 requiring federal agencies to incorporate consideration of environmental justice into the National Environmental Policy Act (NEPA) evaluation process. The purpose of the order is to ensure that minority and low-income communities do not suffer a disproportionate share of high and adverse environmental impacts and are not excluded from the benefits resulting from federal actions. The order also requires that these parties have adequate access and opportunity for participation in project planning. As a federally sponsored project requiring FHWA approval, the C-470 proposed improvements are subject to the environmental justice requirements.

Various federal agencies subsequently issued their own guidance to detail how they would carry out Executive Order 12898. Guidance applicable to FHWA highway projects includes the following:

- Council on Environmental Quality (CEQ) Environmental Justice Guidance under NEPA (1997)
- U.S. Department of Transportation (DOT) Order 5610.2 on Environmental Justice (1997), updated in 2012
- FHWA Guidance on Environmental Justice and NEPA (2011)

Six years after issuing the order on environmental justice, President Clinton issued Executive Order 13166, directing federal agencies to make their programs reasonably accessible for persons who have difficulty understanding the English language. This is summarized as follows by FHWA's website on Limited English proficiency:

Executive Order 13166 challenges federal agencies to "implement a system by which [limited English-proficient or "LEP"] persons can meaningfully access... services consistent with, and without unduly burdening, the fundamental mission of the agency." When read in its entirety, and interpreted consistently with Title VI of the Civil Rights Act of 1964 and Section 504 of the Rehabilitation Act of 1972, the Executive Order applies to all programs and activities of a federal agency, which is, essentially, everything the agency does.

Accordingly, the CDOT NEPA Manual calls for an examination of limited English-proficient populations as part of a NEPA evaluation (CDOT, 2014).

### **1.3 Comparison of the 2006 Analysis and the 2014 Analysis**

An environmental justice analysis was prepared for the C-470 EA that was approved by CDOT and FHWA in 2006. That analysis relied on data from the 2000 Census. That comprehensive analysis examined the entire study area but focused largely on impacts to a low-income area called the Wolhurst Community, located immediately northwest of the I-25/Santa Fe Drive interchange. As described on their website, this neighborhood is a mobile home community of more than 300 residences for persons age 55 or older (Wolhurst Community, 2013). It is not a minority population but is considered low-income due to its many retirees.

Since 2006, a planned flyover ramp for southbound to eastbound traffic has been constructed at the C-470/Santa Fe interchange as a separate safety project with its own environmental clearance process. For the Revised EA, that flyover ramp and its impacts are part of the existing condition. Thus, ramp-construction impacts would not constitute direct or indirect effects of the Revised EA Proposed Action.

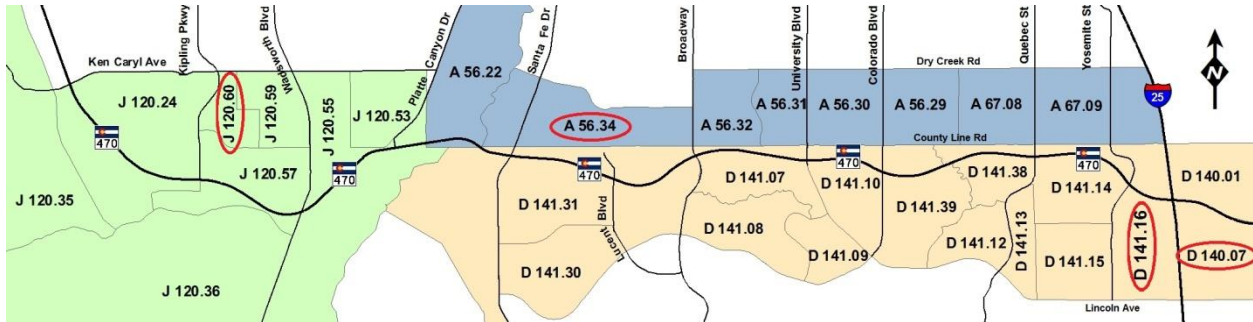
Notable changes making the Revised EA different from the 2006 EA include the following:

- 2010 Census data are now available, whereas the previous EA relied on year 2000 Census data.
- New FHWA Guidance on Environmental Justice and NEPA was issued on December 16, 2011, and US DOT Order 5610.2 was updated in 2012.
- CDOT's NEPA Manual was revised in October 2014, providing detailed instructions for addressing a wide range of social and environmental impacts, including environmental justice.
- A national recession officially occurred between December 2007 and June 2009, with adverse economic impacts that continue today. The Revised EA may reflect more household financial distress than the 2006 EA, as the currently available data may not fully reflect any economic recovery underway at this time.

## 2.0 AFFECTED ENVIRONMENT

The study area for this environmental justice evaluation extends approximately one mile on each side of the existing highway, as it did in the approved 2006 EA. This area comprises 30 Census tracts, as depicted in Figure 3. Existing land use in this area is generally suburban residential, mixed with commercial development and dedicated open space. The 2010 U.S. Census data indicates that the population along the C-470 Corridor study area was 114,465 residents and 45,954 households (Census, 2010a).

**Figure 3**  
**Census Tracts Included in the Analysis**



Note: Letters and colors denote Arapahoe (A), Douglas (D) and Jefferson (J) counties. Tracts highlighted with an oval had the highest percentages of minority or low-income individuals, as detailed in this report.

The study area encompasses portions of three Colorado counties – Douglas, Jefferson and Arapahoe, which have a combined population of 1.4 million, as indicated in Table 1. However, the study area population is only a small portion (8%) of the three-county total, and nearly half of the study area population lives in Douglas County. Thus, study area population characteristics are more reflective of Douglas County than of the two other counties or the three-county total. Approximately 75% of the length of the Proposed Action is located within Douglas County.

**Table 1**  
**Relationship of Population in the C-470 Study Area and Surrounding Counties**

Area Characteristic	Arapahoe County	Douglas County	Jefferson County	3-County Total
Total population, 2010	572,003	285,465	534,543	1,392,011
C-470 study area population by county	28,641	54,136	33,775	114,465
Study area portion of total county population	5%	19%	6%	8%
County portion of study area population	25%	46%	29%	100%

(Census, 2010)

Of the 30 Census tracts in the study area, 13 abut or include the highway, and the remaining 17 are the next closest tracts north or south of the highway, as summarized in Table 2.



**Table 2**  
**Census Tracts Examined, by Location**

Census Tract Characteristic	Arapahoe County	Douglas County	Jefferson County	Totals
Number of Census tracts that include or abut C-470	2	7	4	13
Other nearby Census tracts included in the analysis	6	7	4	17
Total Census tracts examined	8	14	8	30

Each Census tract is further divided into smaller areas called block groups (i.e. groups of individual Census blocks). The 30 Census tracts in the study area contain a total of 73 block groups. Race, ethnicity, income and other demographic data were initially examined at the tract level, and tracts of particular interest were then examined at the block group level, if appropriate.

## 2.1 MINORITY POPULATIONS

The U.S. DOT Order 5610.2 defines the term minority as a person who is Black/African American, Asian or Pacific Islander (including Native Hawaiian), American Indian or Alaskan Native, or from Hispanic/Latino culture or origin, regardless of race. A minority population includes any readily identifiable group of minority persons who live in geographic proximity who will be affected by a proposed program, policy, or activity. The CEQ has a similar definition, but goes on to say that minority populations exist where the minority population of an affected area is greater than 50 percent, or is meaningfully greater than the minority population percentage of the surrounding geographic area. The 50% minority threshold is not met anywhere in the C-470 corridor.

The US DOT definition for minorities combines racial origin and ethnic origin that are asked as two separate questions on the Census form. The U.S. Census form choices for race include White, Black/African American, American Indian and Alaska Native, Asian, Native Hawaiian and other Pacific Islander, two or more races, and some other race. Hispanic is not available as an answer to this question of race. A separate Census question asks whether or not the respondent is Hispanic or Latino.

### 2.1.1 Race

According to the 2010 Decennial Census, approximately 91.1% of the residents within the study area reportedly were of white race alone, while 8.9% were of other races or of multiple races.

The data presented in Table 3 indicate that the study area has lower percentages of racial minorities than its three surrounding counties. Racial minorities accounted for 11.8% of the population in Arapahoe and Jefferson counties, and 22.3% in Arapahoe County. The percentage of racial minorities for the entire State of Colorado, not shown in the table, was 18.3%.

*In 2010, the population in the study area was 91.1% white alone. The 8.9% racial minorities here were less than half the Colorado statewide percentage.*

**Table 3**  
**Race in the C-470 Study Area and Surrounding Counties**

Reported Race	Study Area		Arapahoe County		Douglas County		Jefferson County	
	Persons	% of Total	Persons	% of Total	Persons	% of Total	Persons	% of Total
White	104,309	91.1%	415,910	72.7%	257,598	88.2%	472,694	88.2%
Asian	3,937	3.4%	29,077	5.1%	10,716	3.8%	14,037	2.6%
African-American	1,346	1.2%	58,107	10.2%	3,476	1.2%	5,667	1.1%
Other Race, or Combined Races	4,873	4.3%	68,909	12.0%	13,675	6.8%	42,145	8.1%
Total	114,465	100.0%	572,003	100.0%	285,465	100.0%	534,543	100.0%

The largest percentages of racial minorities shown in Table 3 (e.g., 4.3% for the study area) are for Other Race, or Combined Races, which encompass several responses from the Census form. Additionally, Native Americans (ranging from 0.1% to 0.8% in the 30 Census tracts) and Hawaiian/Pacific Islanders (typically 0.1%) were so few in the study area that they have also been reported in this category. The next most prevalent racial minority group in the C-470 area was Asian, at 3.4%. African-Americans accounted for 1.2%. More detail is available in Appendix A to this Technical Report.

The percentages reported in Table 3 are aggregated for the entire study area of approximately 26 square miles (e.g., 13 miles long and two miles wide), which includes 30 separate Census tracts. Upon further examination, racial minority populations were slightly higher (9.5%) for the 13 tracts that are adjacent to C-470 as compared to the 17 tracts that are not immediately adjacent to the highway (8.4%).

Two Census tracts in Douglas County exhibited racial minority percentages that were notably higher than the study area averages, as detailed in Table 4. Both of these Census tracts are located at the extreme eastern end of the study area.

**Table 4**  
**Racial Composition in Selected Census Tracts**

Reported Race	Study Area		Douglas County		Douglas County Census Tract 140.07		Douglas County Census Tract 141.16	
	Persons	% of Total	Persons	% of Total	Persons	% of Total	Persons	% of Total
White	104,309	91.1%	257,598	88.2%	1,964	81.5%	3,703	83.4%
Asian	3,937	3.4%	10,716	3.8%	191	7.9%	426	9.6%
African-American	1,346	1.2%	3,476	1.2%	90	3.7%	108	2.4%
Other Race, or Combined Races	4,873	4.3%	13,675	6.8%	165	6.9%	203	4.6%
Total	114,465	100.0%	285,465	100.0%	2,410	100.0%	4,440	100.0%

(Census, 2010)

Douglas County Census Tract 140.07 is located south of C-470 and east of Interstate 25, just beyond the eastern limit of construction for proposed C-470 improvements. This is the easternmost tract that is highlighted in a red oval in Figure 1, presented previously. Of the 30 Census tracts examined, this one had the highest total racial minority percentage (18.5%), a level that is comparable to the statewide average of 18.3% (in a corridor otherwise at 8.9%, or about half the statewide average). This tract also had the highest percentages for the categories of African-American (3.7%) and the “two or more races” (3.8%) Census response, and the second highest percentage for Asian races (7.9%).

Immediately west of the tract discussed above, Douglas County Census Tract 141.16 extends both north and south of C-470 between Yosemite Avenue and Interstate 25, and from County Line Road to Lincoln Avenue. Out of all 30 Census tracts examined, this one had the highest percentage (9.6%) for persons of Asian races. This number is well above the percentages for the State of Colorado (2.8%), Douglas County (3.8%), and the C-470 study area (3.4%) overall. According to the Census Bureau, about 250 people from the country of India account for more than half of the Asian population in Census Tract 141.16. Upon closer examination at the block group level, the Asian population is concentrated in Block Group 3, which abuts Interstate 25.

### 2.1.2 Hispanic Ethnicity

Only 6.9% of the study area’s residents characterized themselves as Hispanic or Latino in the 2010 Census. This was a smaller percentage than for the three surrounding counties (Douglas County 7.5%, Jefferson County 14.3%, Arapahoe County 18.4%). The numbers for the study area and surrounding counties are provided in Table 5.

In 2010, 6.9% of the population in the C-470 study area was Hispanic. This was about one third of the 20.4% Hispanic for the State of Colorado.

**Table 5**  
**Hispanic Ethnicity in the C-470 Study Area and Surrounding Counties**

Ethnic Characteristic	Study Area		Arapahoe County		Douglas County		Jefferson County	
	Persons	% of Total	Persons	% of Total	Persons	% of Total	Persons	% of Total
Not Hispanic or Latino	106,622	93.1%	466,481	81.6%	264,073	92.5%	458,098	85.7%
Hispanic or Latino	7,843	6.9%	105,522	18.4%	21,392	7.5%	76,445	14.3%
Total	114,465	100.0%	572,003	100.0%	285,465	100.0%	534,543	100.0%

(Census, 2010)

Examination of the 30 Census tracts comprising the study area found percentages of Hispanic residents ranging from 3.3% to 11.1%. The highest percentage was found in Jefferson County Census Tract 120.60, at the western end of the study area. It is located immediately east of Kipling Parkway and north of Chatfield Avenue, beginning about a half mile north of C-470.

The second-highest Hispanic ethnicity percentage, 10.7%, was reported in Douglas County Census Tract 140.7 (described earlier), east of Interstate 25, which was the tract with the highest percentage of racial minorities.

### 2.1.3 Minority Population

To determine the total minority population under the US DOT definition, the number of white persons of Hispanic origin is added to the number of non-white persons of any ethnicity. This avoids double-counting persons who are both Latino and non-white as being minorities. Table 5 below presents the percentages of non-minority and minority populations in the C-470 study area and its surrounding counties.

In 2010, the minority population in the C-470 study area was 13.3%. This is well below the 50% threshold that is one of CEQ's definitions for a minority area.

The data in Table 6 indicate that the 13.3% minority population in the C-470 study area is lower than the percentage for Douglas County (14.8%), which in turn is significantly lower than that of Arapahoe and Jefferson counties.

**Table 6**  
**Minority Population in the C-470 Study Area and Surrounding Counties**

Characteristic	Study Area		Arapahoe County		Douglas County		Jefferson County	
	Persons	% of Total	Persons	% of Total	Persons	% of Total	Persons	% of Total
Non-Minorities	99,190	86.7%	450,423	78.7%	243,297	85.2%	427,160	79.9%
Minorities	15,275	13.3%	121,580	21.3%	42,168	14.8%	107,383	20.1%
Total	114,465	100.0%	572,003	100.0%	285,465	100.0%	534,543	100.0%

(Census, 2010)

Among the 30 Census tracts in the C-470 study area, the minority population percentages range from a low of 7.4% to a high of 25.4%. The 25.4% figure corresponds to Douglas County Census Tract 140.07, which was previously identified as the tract with the highest racial minority percentage. As previously stated, Census Tract 140.07 is located south of C-470 and east of Interstate 25, beyond the eastern limit of construction for proposed C-470 improvements.

### 2.1.4 Households with Limited English Proficiency

Another population group examined in a NEPA analysis is persons with limited English proficiency (i.e., the inability of some residents to speak English very well). Inability to speak English well can hinder one's ability to participate effectively in public decision-making processes involving transportation projects or other proposed government actions.

Consideration of households with limited English proficiency is examined here in accordance with FHWA guidance and the CDOT NEPA Manual. Note that this topic

focuses on households, rather than individuals, since an English-speaking adult in a household would have the ability to translate and communicate to the other residents. The lack of a capable English speaker in the household effectively isolates all persons living there.

A Census Bureau question addressing this issue asks whether or not the household includes anyone aged 14 or over who speaks English well. The latest available Census data for the C-470 study area, presented in Table 7, indicate that an estimated 668 households (1.5%) out of 45,954 have no adult who speaks English well. Of these 668, only about one third (0.5%) speak Spanish at home, and the remaining two-thirds include all other (non-English) languages combined. Spanish is the predominant language spoken in the households where there is a language barrier.

**Table 7**  
**Households Where “No One 14 and Over Speaks English Well”**

Household Characteristic	Study Area		Arapahoe County		Douglas County		Jefferson County	
	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total
Total Households	45,954	100.0%	221,136	100.0%	100,795	100.0%	217,763	100.0%
Households with a language barrier	668	1.5%	12,647	5.7%	1,296	1.3%	3,478	1.6%
Of these, number where the spoken language is:								
• Spanish	217	0.5%	7,420	3.4%	415	0.4%	1,703	0.8%
• Other	451	1.0%	5,227	2.4%	881	0.9%	1,775	0.8%

(Census, 2010)

The C-470 study area’s 1.5% of households with a language barrier is comparable to the percentages for Douglas County (1.3%) and Jefferson County (1.6%), but much lower than the 5.7% found in Arapahoe County.

Examining the study area in greater detail, the language barrier percentages for the 30 Census tracts ranges from zero to 3.6% for all tracts, except for a 5.8% value (all of them Spanish-speaking households) found in Jefferson County Census Tract 120.60. The Census Bureau estimates that 82 out of 1,415 households in this tract have a language barrier. This equates to one out of every 17 households in the area. As noted previously, this is the Census tract with the highest percentage of Hispanic population along the C-470 corridor, and is located a half mile north of C-470 at the western end of the study area.

The two block groups that comprise Jefferson County Census Tract 120.60 were examined and it was determined that this Spanish-speaking population is located primarily in Block Group 1, a neighborhood called Dakota Station. This block group is bounded by Kipling Parkway on the west, Garrison Street to the east, Chatfield Avenue on the south, and Ken Caryl Avenue.

## 2.2 LOW-INCOME POPULATIONS

As with minority populations, low-income populations can be spread throughout the community study area, but there may be a concentrated area that has a significantly higher percentage of low-income population than the county or metro area average. Thus, the approach to identifying low-income populations is a two-stage process beginning with Census data review and continuing with more detailed examination where appropriate.

### 2.2.1 Census Income Data

Low-income populations were determined in accordance with the CDOT NEPA Manual. County Census data and county-specific income data from the U.S. Department of Housing and Urban Development (HUD) are used to determine the areas for low-income populations. Specifically, the HUD data identify the income level that is 30 percent of median income for the county (HUD, 2013).

Douglas County is the 7th wealthiest county in the United States, with a median household income of about \$100,000 per year. (Forbes, 2013)

Following the procedures in the CDOT NEPA Manual, the annual household incomes for the average household size in the three counties were determined as follows:

- Arapahoe County \$19,946, based on average household size of 2.53 persons
- Douglas County \$20,557, based on average household size of 2.79 persons
- Jefferson County \$19,687, based on average household size of 2.42 persons

Household income data are available from the Census Bureau for income thresholds in increments of \$5,000. The dataset used was the American Community Survey 5-year estimates for 2007-2011 (Census, 2011). Using the data for households with \$20,000 income thus closely and conservatively approximates the low-income household percentages for Arapahoe County and Jefferson County, “erring” on the side of including a small number of households above the target threshold. For Douglas County, however, using the \$20,000 threshold would slightly underestimate the number of low-income households while using the \$25,000 would result in a substantial overestimate. The Douglas County issue affects the project corridor percentage because 14 (almost half) of the 30 Census tracts in the analysis are in that county.

Table 8 presents the result of the calculations for percentages of low-income households. Somewhere in the range of 5.9% to 6.9% of households in the study area are low-income; the number is probably 6.0 or 6.1%. This compares with about 5 percent for Douglas County, 11.2% for Jefferson County, and 14.2% for Arapahoe County.



**Table 8**  
**Low-Income Households in the Study Area and Surrounding Counties**

Household Characteristics	Study Area	Arapahoe County	Douglas County	Jefferson County
Total Households	45,954	221,136	100,795	217,763
Low-Income Households*	2,700 to 3,152	30,965	4,713 to 6,363	24,371
Low Income Households as a Percentage of Total Households	5.9% to 6.9%	14.2%	4.7% to 6.3%	11.2%

\* Douglas County range covers annual household incomes of \$20,000 (slight underestimate of low-income households) and \$25,000 (major overestimate of low-income households), as the county's threshold figure is \$20,557. This results in a range for the study area total also.  
 (Census, 2010; HUD, 2013)

Examination of the 30 individual Census tracts that comprise the C-470 study area determined that three census tracts had low-income household percentages of 12 percent or more (i.e., about twice the average for the C-470 corridor). These are:

- 14.8% in Arapahoe County Census Tract 56.34
- 13.4% in Jefferson County Census Tract 120.60
- 12.7% in Douglas County Census Tract 140.07

Arapahoe County Census Tract 56.34 is the locale of the Wolhurst mobile home community, with its more than 300 residences for persons age 55 or older. This community is located at the northwestern quadrant of the interchange of C-470 and Santa Fe Drive. Wolhurst was identified as a key low-income community of concern in the 2006 C-470 EA, based on detailed analysis and extensive community outreach. The 2006 C-470 EA included provision of a southbound-to-eastbound flyover ramp at the interchange, with a wide range of impacts to the Wolhurst Community. That interchange improvement subsequently underwent a separate environmental clearance process and has been constructed, and appropriate mitigation was implemented. Extensive details regarding Wolhurst were provided in the approved 2006 C-470 EA but are not necessary in this Revised EA because the Proposed Action in this revised EA does not include major improvements at the C-470/Santa Fe interchange.

Jefferson County Census Tract 120.60 was mentioned above as the location of the study area's highest percentage of Hispanic persons, located immediately east of Kipling Parkway and north of Chatfield Avenue, a mile north of C-470.

Douglas County Census Tract 140.07 was identified above as the tract with the highest concentration of racial minorities and total minorities, located south of C-470 and east of Interstate 25, beyond the eastern limit of construction for proposed C-470 improvements.

### 2.2.2 School Lunch Subsidy Data

As additional analysis of low-income indicators, the 2006 C-470 EA reviewed Internet-available statistics on the number of students eligible to receive a government-

subsidized free or reduced-price lunch at schools within the C-470 study area. Each year, parents fill out an eligibility form to qualify for federal reduced or free lunch programs. To qualify for subsidized school lunch, a household must make 185 percent or less of the Federal Poverty Guideline. To qualify for free lunch, a household must make 130 percent or less of the Federal Poverty Guideline. Subsidy eligibility data are found on the National Center for Education Statistics website (NCES, 2013) and were reviewed to obtain information for the most recently available school year, which was 2010-2011.

Notwithstanding the income threshold noted above, the current application form for school lunch subsidies states that children from households receiving benefits from the Supplemental Nutrition Assistance Program (SNAP) are automatically eligible for free lunches “regardless of your income” (USDA, 2013a). The number of households receiving SNAP (formerly called Food Stamps) nationwide more than doubled between Fiscal Year (FY) 2003 and FY 2011 (USDA, 2013b), while the number in Colorado nearly doubled between FY 2008 and FY 2011 alone (USDA, 2013c).

The previous analysis reported statistics for the 2002-2003 school year for 13 area schools. The free lunch threshold was an income of \$22,945, and the threshold for a reduced price lunch was \$32,650. The corresponding levels for the most recent available data (2010-2011 school year) are \$29,055 and \$41,348. These eligibility levels are far higher than the AMI30 income data used above in Section 2.2.1 to define and discuss low-income households.

Comparing the results of the two analysis years, the total enrollment at the same 13 schools was virtually unchanged. The previous total of 11,232 students had grown only to 11,259, a difference of only one-fourth of one percent. Over the same eight-year period, however, the number of students meeting the free lunch eligibility criterion went from 1.8% to 10.0%, and the number in the reduced-price category increased from 2.0% to 3.0%. Adding the two categories together, the percentage of students eligible for either subsidy previously ranged from 0.70% to 10.2% for the 13 schools, while the new range is 6.5% to 31.8%. For the 13 schools combined, total eligibility jumped from 427 students to 1,459 students.

The noticeable jump in lunch subsidy eligibility occurred at all 13 schools. The national eligibility criteria remained at 130% and 185% of the Federal Poverty Guideline, although that guideline did increase from \$17,650 to \$23,350, an increase of nearly 27%. Total eligibility nationwide increased by 28.7% for the same eight-year period, from 16.4 million to 21.1 million students, according to the U.S. Department of Agriculture. This nationwide increase is far smaller than the 250% free lunch eligibility increase reflected in the 13 study area schools.

For each analysis year, the same school had by far the highest eligibility percentage. This was the Columbine Hills Elementary School at 6005 West Canyon Avenue in Littleton. The increase in school lunch eligibility at Columbine Elementary School from 52 out of 512 students in FY 2003 to 138 out of 433 students in FY2011 is due to



program eligibility changes (i.e., pertaining to increased use of SNAP/Food Stamps), rather than being indicative of a major change in neighborhood demographics.

Columbine Elementary School in Littleton is located within Jefferson County Census Tract 120.55, and specifically within Block Group 1. This Census tract reportedly has a percentage of low-income households (6.5%) that exceeds the average for its county (6.2%), but only by a small margin. This area was not identified as a low-income area in the 2006 EA, and the newer data do not appear to warrant calling it that in 2014 either.

### **2.2.3 Other Income Indicators**

The 2006 C-470 EA examined each Census block group that had a higher percentage of AMI30 households than its surrounding county. In addition to the block group containing the Wolhurst community, a total of nine block groups were investigated, including only one that has been discussed above (Douglas County Census Tract 141.07, specifically Block Group 1), five in the Highlands Ranch subdivision of Douglas County, and three in Jefferson County. None of these correspond with any subarea specifically discussed above in this 2014 environmental justice analysis. Site inspections were made in each of these block groups to see if there was visually apparent evidence of low-income households.

The 2006 EA also included telephone calls to local public housing administrators to inquire about localized availability of federally-subsidized Section 8 housing. It was determined that there was minimal subsidized housing in the area. Three apartment complexes near C-470 reported offering tax credits for low-income residents, but further examination led to the conclusion that these apartment complexes are not considered low-income populations.

The 2006 EA concluded that no subarea along the corridor merited further consideration as a low-income or minority area of concern except for the Wolhurst Community. As noted earlier, the C-470 Preferred Alternative in the 2006 EA included flyover ramp construction at the C-470/Santa Fe interchange, directly impacting the Wolhurst mobile home community. That construction project has since been completed and the Revised EA includes no similar component directly affecting that community.

Based on the outcome that additional indicators and site inspection revealed no other low-income populations in the previous analysis, additional indicators were not researched further for this Revised EA.

## **2.3 CONCLUSIONS REGARDING ENVIRONMENTAL JUSTICE POPULATIONS**

It is concluded in this Revised EA, as in the 2006 C-470 EA, that the Wolhurst mobile home community on South Santa Fe Drive at C-470 is a low-income population for purposes of assessing environmental justice impacts. This neighborhood has the highest percentage of low-income households of any along the C-470 corridor, at more than double the corridor average and also higher than its surrounding county.

For the 2014 Revised EA, a second subarea is being deemed suitable for consideration of environmental justice impacts. Section 2.2.1 above cited the alternative threshold for a minority area where the minority population of an affected area is “meaningfully greater than the minority population percentage of the surrounding geographic area.” Douglas County Census Tract 140.07 was mentioned repeatedly in the various sections of the environmental justice analysis, and is circled as a focus area in Figure 3. It appears to meet the CEQ criterion for “meaningfully greater than” because it has:

- The study area’s highest total minority population (25.4%), nearly double the study area average of 13.3%.
- The study area’s highest percentage of racial minorities (18.1%), nearly double the study average of 8.9%.
- The study area’s highest percentage of African-Americans (3.7%) and persons of two or more races, and second-highest percentage of Asians (7.9%).
- The study area’s second highest percentage of persons of Hispanic ethnicity (10.9%), about 50 percent higher than the study area average of 8.9%.
- The study area’s third-highest percentage of low-income households (12.7%), more than double the study area average (approximately 6%).

The same area was carefully considered in the 2006 EA and determined not to be an area of concern. The 2006 C-470 EA described Block Group 1, which it referred to as ID #34, as follows:

This census block group, located immediately east of I-25 and south of C-470/E-470 is generally made up of office and commercial uses as part of the Meridian development, and one luxury apartment complex along Lincoln Avenue. Further east on Lincoln Avenue, the landscape becomes suburban, with large lot single-family residential development known as Grandview Estates. Many of these homes have horses on property. CDOT, 2005)

Racial and ethnic composition, rather than household income, is the reason for making a different judgment call in 2014. For the 2014 Revised EA, it appears reasonable to consider Census Tract 140.07 a minority population area.

Finally, considered but not selected as an area of potential environmental justice impacts was Jefferson County Census Tract 120.60. While it had the highest percentage of Hispanics (11.1%), this is little more than half the Colorado statewide average of 20.4%. More importantly, the total percentage of racial and ethnic minorities in this area was only 15.9%, not meaningfully higher than the study area (13.3%) and well below the percentage for its surrounding county (20.1%). The 82 Spanish-speaking households with a language barrier in this Census tract are not an environmental justice issue under Executive Order 12898, but rather a factor to be taken into account in the further public outreach activities for the Proposed Action under Executive Order 13166.

Jefferson County Census Tract 120.60 had the second highest percentage of low-income households (13.4%), a number twice the study area average, but not meaningfully above the Jefferson County average (11.2%). It should be kept in mind that the study area average is dominated by Douglas County, the seventh richest

county in the United States. Finally, unlike the two other census tracts discussed above, this tract beginning a half mile north of the freeway does not include or abut C-470, so would not be directly affected by the Proposed Action. It is concluded that this Census tract is not a low-income area for the purposes of environmental justice analysis.

## **3.0 ENVIRONMENTAL CONSEQUENCES**

Environmental consequences or impacts, as they pertain to the populations subject to the Environmental Justice guidelines, were evaluated as part of the C-470 EA. The impacts were considered with regard to their context and intensity.

### **3.1 NO-ACTION ALTERNATIVE**

The only improvements included in this alternative are those projects with dedicated funding, included as municipal Capital Improvement Plans or DRCOG's MetroVision 2035 Regional Transportation Plan (RTP). As such, the Wolhurst Community and Douglas County Census Tract 141.07 east of I-25 would not receive any impacts other than those that will occur over time as a result of increased congestion on C-470, and the resulting increased noise and air quality effects of that congestion.

### **3.2 PROPOSED ACTION**

The Proposed Action would widen C-470 to add two tolled lanes in each direction, and to add auxiliary lanes where needed, associated with minimal on-ramp and off-ramp modifications. It would not provide any new access to C-470 as was previously proposed in the 2006 EA. Also, advance signage would be needed at either end of the project (including on the north-south I-25 freeway) to alert approaching motorists that they need to decide whether to get into the free lanes or the toll lanes.

#### **3.2.1 Land Acquisition**

A small amount of land will need to be acquired from land abutting the existing C-470 right-of-way. Over the entire 13-mile corridor (with 26 miles of adjacent property lines), the 2006 EA estimated that only 20.25 acres of additional land would need to be acquired. Some of this land was needed for the C-470/Santa Fe flyover ramp that has already been constructed. The Proposed Action for the Revised EA will require an estimated 40 acres, most of it necessary to accommodate roadside water quality detention basins. All land needed is vacant with no buildings to be acquired. Thus, there would be no need to relocate any business or residence.

#### **3.2.2 Traffic Flow and Toll Costs**

The Proposed Action is being undertaken specifically to improve C-470 traffic flow, compared with a worsening of current congestion as expected with the No-Action Alternative. The addition of four tolled lanes on C-470 will increase the highway's traffic-carrying capacity. Improved traffic flow on C-470 would benefit all users of the highway, whether they choose to use the express lanes or not. Those paying the toll would receive the benefit of higher travel speeds and improved travel time reliability. They would not choose to pay the toll unless they received improved traffic flow in return.

Those choosing to use the free lanes would face more congested conditions and slower travel speeds, but these conditions would be better than the extreme congestion of the No-Action Alternative.

Low-income populations such as the Wolhurst Community or the residents of Douglas County southeast of the C-470/I-25 interchange would have the choice of using the free lanes or the toll lanes, just like any other C-470 motorist. Based on their economic limitations, they are likely to choose to use the free lanes, along with a large number of middle-income and high-income motorists. Theoretically, the free lanes will always carry more vehicles than the express lanes, due to the toll. This means that over 50% of C-470's motorists will be in the free lanes. Since low-income households account for just 6% of the study area population, low-income motorists will always be sharing the free lanes with a much larger number of middle-income and high-income motorists. All users of the free lanes will benefit from improved traffic flow as noted above.

I-25 and Santa Fe Drive (US Highway 85) are major north-south routes that intersect C-470. Ingress and egress for the managed express lanes will definitely be located in a manner that maximizes convenience for I-25 motorists and Santa Fe motorists. Thus, express lane access will be conveniently available to residents of both identified areas of low-income populations, although they may choose not to take advantage of this convenient access.

Work trips during congested peak period conditions are considered to be a key element of the overall demand for express lane use. The Wolhurst Community is home to adults aged 55 or older, many of whom are retired and would not normally use C-470 for peak-period commuter trips. According to the 2010 Census, the percentage of the population in Arapahoe County Census Tract 56.34 that is over age 55 was 54.2%. This is more than twice the study area average of 24.4%, and is much higher than the Census tract with the next highest percentage (34.3%).

The environmental justice analysis for another toll lane project in the Denver area (the U.S. 36 Environmental Impact Statement) included the following information about toll lane use by various income groups, as follows:

“Various studies of tolled express lane projects (I-15 in San Diego County, California; State Route 91 in Orange County, California; and the Quick Ride Program on I-10 in Houston, Texas) have focused on the use of express lanes by low-income populations. The evaluations found that low-income drivers use the express lanes and approve of these lanes as much as higher-income drivers. The majority of SOV [single occupant vehicle] commuters, even those from higher-income households, do not use the tolled lanes for every trip.” (CDOT, 2009).

An important consideration for low-income users of a tolled facility is any requirement to prepay for the use, or the need for the user to have a credit card. Toll collection based on license plate recognition and billing allows users to pay after using the toll road, rather than paying in advance. Typically, however, toll road authorities charge additional

costs (e.g. 25% higher) for license plate billing, as compared with prepayment and the use of electronic transponders.

The U.S. 36 EIS stated the following regarding this transponder issue:

“Transponders are free, but an account must be set up with a reserve balance to pay for each use. Studies show that methods for electronic toll collection should be considered and arrangements should be provided for individuals who may not have a credit card. Tolling programs should consider not excluding low-income drivers because of requiring upfront expenditures or requiring computers or credit cards for enrollment. For example, access to transponders could be a problem for some individuals if one needs either a credit card or lump sum deposit to open an account. In the future, technology changes, such as License Plate Tolling, currently being implemented on E-470, would provide options for low-income drivers that would not require setting up an account.”

As of 2015, specific toll costs and toll collection policies for the C-470 managed express lanes have not been finalized, but it is expected that both transponders and license plate photo billing options will both be in use as part of the C-470 Proposed Action.

### **3.2.3 Air Quality**

The Air Quality Technical Report for the Revised EA examines predicted future conditions for the Proposed Action and concludes that the project would not cause nor contribute to a violation of any national ambient air quality standard. The 2006 EA included microscale-level carbon monoxide concentration modeling for Santa Fe Drive at County Line Road, at the entrance to the Wolhurst Community, and concluded that no air quality problems were foreseen there. Traffic flow has improved at that location with the opening of a southbound to eastbound flyover ramp in 2011.

C-470 carries minimal heavy truck traffic, compared with all other freeways in the Denver Region (CDOT, 2013). Adding toll lanes would not be likely to attract additional heavy truck traffic to the corridor, as the proposed pricing plans would attempt to discourage use of these lanes by heavy trucks. Diesel trucks produce more of some emission types (particulate matter, mobile source air toxics) than do passenger cars and pickup trucks.

### **3.2.4 Highway Noise**

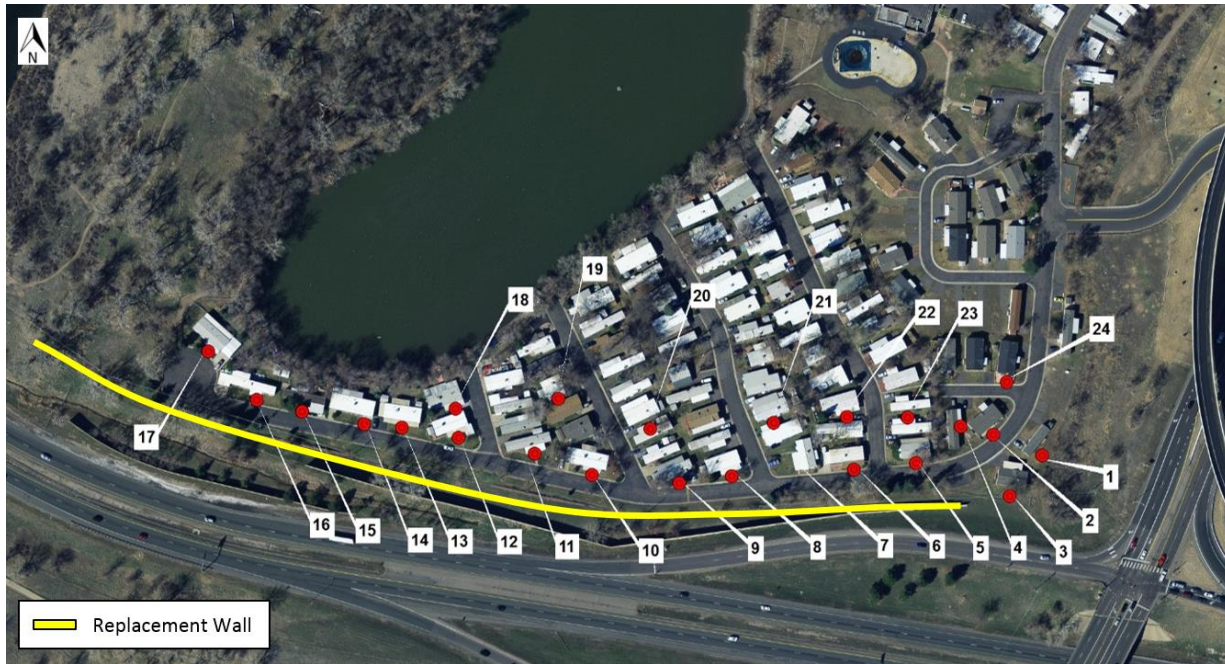
As a result of the proposed highway widening, highway noise levels on C-470 are expected to increase. The number of traffic lanes would increase, the number of vehicles on the highway would increase, and the highway widening would expand the traveled roadway surface outward, closer to adjacent land uses.

In the case of the Wolhurst Community, there already is an existing noise wall along the westbound on-ramp to C-470. In this particular location, the 2006 EA did not predict a new noise impact needing to be addressed, but the roadway design would necessitate removing and replacing the existing noise wall. The replacement wall is expected to be slightly higher and longer than the existing wall. The 2006 EA estimated its dimensions



to be 1,550 feet long and 20 feet high for the Express Lanes Alternative, which is similar to the 2015 Proposed Action. When the engineering designs are developed, the appropriate length and height of the replacement wall will be finalized, along with decisions regarding its aesthetic details. The dimensions will be adjusted as appropriate in response to the latest available noise modeling for this location. Figure 4 below, excerpted and adapted from the 2006 EA Noise Technical Report (Figure 4-7), depicts the conceptual dimensions and location for the replacement wall.

**Figure 4**  
**Conceptual Size and Location for Wolhurst Community Replacement Noise Wall**



The numbered boxes on this graphic indicate residences or other specific land uses where predicted noise levels were predicted, referred to as modeled noise receptors. The yellow line depicts a recommended single, continuous noise barrier approximately 1,500 feet long and 15.5 feet tall, to replace the existing noise barriers at this location.

The 2006 C-470 EA did not identify any noise impacts affecting Douglas County Census Tract 141.07, southeast of the I-25/C-470 interchange.

## 4.0 MITIGATION

The 2015 Proposed Action would not have any impacts to the Wolhurst low-income population or the Douglas County Census Tract 141.07 minority population, and therefore no mitigation is planned. The replacement of the existing Wolhurst noise wall would occur due to construction constraints, rather than in response to any new foreseen noise impact. Replacing the existing wall with a longer higher wall that addresses foreseeable C-470 noise levels would be done regardless of whether or not

the Wolhurst Community was considered a low-income area. CDOT will coordinate closely with the Wolhurst Community in the design of the replacement noise wall, continuing its outreach that has been ongoing now for approximately nine years.

In recognition of the identified cluster of households with limited English proficiency in the Dakota Station neighborhood a half mile north of C-470 and east of Kipling, CDOT will prepare outreach materials in Spanish to distribute or post in that neighborhood in advance of the Public Hearing for the Revised EA. CDOT routinely publicizes the availability of resources to accommodate Spanish speakers at public hearings.

## 5.0 PUBLIC OUTREACH

CDOT undertook an extensive public involvement program for the 2006 C-470 EA, which is the basis for much of the content in the Revised EA. The previous effort identified no minority populations meeting FHWA and CEQ minority thresholds in the study area, and determined that the Wolhurst Community was the only distinct low-income population along the corridor. Two major efforts at public outreach have been undertaken since 2006 – the process for developing the Santa Fe/C-470 flyover ramp and the C-470 Coalition’s multi-year campaign to refine the preferred alternative (Express Lanes) from the 2006 EA into the 2015 Proposed Action which now has unanimous support from all of the affected county and local governments in the corridor.

Development of the Santa Fe/C-470 flyover ramp involved continuing close coordination with the Wolhurst Community, throughout project design and construction. This level of outreach would have been undertaken regardless of whether or not Wolhurst was a low-income area.

In the most recent public outreach effort, CDOT has participated as a member of the C-470 Corridor Coalition. This organization was formed in 2011 to provide a forum for local governments, business organizations and citizens to consider funding options and ultimately reach consensus on a plan to pay for improving the corridor from I-25 to I-70. The Proposed Action between I-25 and Kipling Parkway is considered the first implementable portion of the Coalition’s long-term vision.

An innovative outreach technique used by the C-470 Corridor Coalition in summer 2012 a series of Telephone Town Hall meetings. Over 200,000 telephone calls were made to invite residents in the C-470 area to participate in the telephone meetings with elected officials.

Additionally, the C-470 Corridor Coalition conducted four Public Open House Meetings in August and September 2012, at locations along the corridor, and made outreach presentations to meetings of the Highlands Ranch Community Association (an organization of delegates from 95 different homeowners’ associations in the area) and the Roxborough Park Home Owners Association. These were publicized meetings intended to obtain public input on various funding options. One of these options was to

implement Managed Express Lanes. Under this option, users of the facility would pay for it rather than the cost being shared by the local public as a whole.

Further public outreach will occur in the form of a Public Hearing regarding the Revised EA, as noted above. If this process eventually leads to implementation of the Proposed Action, CDOT and/or its contractor will again closely coordinate with the Wolhurst Community regarding the planned replacement of the existing C-470 noise wall along the southern side of that neighborhood.

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## **APPENDIX A – DETAILED DATA TABLES**

The following pages contain detailed data tables as follows:

Table A-1. Racial Populations from 2010 Census

Table A-2. Hispanic Ethnicity from 2010 Census

Table A-3. Total Minorities from 2010 Census

Table A-4. Linguistically Isolated Households from American Community Survey

Table A-5. Low-Income Households

Table A-6. Subsidized Lunch Eligibility for 13 Area Schools, FY 2003 and FY 2011  
From U.S. Department of Education, National Center for Education  
Statistics (NCES)

**Table A-1**  
**Racial Populations from 2010 Census** (continued on next page)

County	Tracts that Abut or Include C-470	Population	White	Per-cent	Asian	Per-cent	African Amer.	Per-cent	Other or Combinations	Per-cent
Arapahoe	56.22	2,326	2,169	93.3%	54	2.3%	26	1.1%	77	3.3%
	56.34	2,959	2,818	95.2%	34	1.1%	30	1.0%	77	2.6%
Douglas	141.07	3,718	3,380	90.9%	118	3.2%	38	1.0%	182	4.9%
	141.10	5,233	4,626	88.4%	230	4.4%	123	2.4%	254	4.9%
	141.14	3,678	3,415	92.8%	77	2.1%	38	1.0%	148	4.0%
	141.16	4,440	3,703	83.4%	426	9.6%	108	2.4%	203	4.6%
	141.31	3,283	3,000	91.4%	137	4.2%	39	1.2%	107	3.3%
	141.38	2,902	2,484	85.6%	196	6.8%	69	2.4%	153	5.3%
	141.39	4,052	3,516	86.8%	318	7.8%	70	1.7%	148	3.7%
Jefferson	120.36	3,707	3,476	93.8%	93	2.5%	14	0.4%	124	3.3%
	120.53	3,794	3,555	93.7%	46	1.2%	22	0.6%	171	4.5%
	120.55	3,706	3,399	91.7%	73	2.0%	26	0.7%	208	5.6%
	120.57	5,705	5,256	92.1%	122	2.1%	37	0.6%	290	5.1%
Subtotals	13 Tracts	49,503	44,797	90.5%	1,924	3.9%	640	1.3%	2,142	4.3%

County	Tracts Farther from C-470	Population	White	Per-cent	Asian	Per-cent	African Amer.	Per-Cent	Other or Combinations	Per-Cent
Arapahoe	56.25	2,899	2,675	92.3%	65	2.2%	37	1.3%	122	4.2%
	56.30	5,322	4,941	92.8%	128	2.4%	52	1.0%	201	3.8%
	56.31	3,028	2,837	93.7%	61	2.0%	27	0.9%	103	3.4%
	56.32	3,189	2,977	93.4%	74	2.3%	29	0.9%	109	3.4%
	67.05	4,979	4,540	91.2%	179	3.6%	39	0.8%	221	4.4%
	67.08	1,748	1,670	95.5%	20	1.1%	17	1.0%	41	2.3%
Douglas	141.01	6,242	5,526	88.5%	182	2.9%	96	1.5%	438	7.0%
	141.07	2,410	1,964	81.5%	191	7.9%	90	3.7%	165	6.8%
	141.08	4,894	4,559	93.2%	105	2.1%	32	0.7%	198	4.0%
	141.09	2,259	2,119	93.8%	66	2.9%	13	0.6%	61	2.7%
	141.12	3,834	3,469	90.5%	157	4.1%	60	1.6%	148	3.9%
	141.13	3,046	2,663	87.4%	208	6.8%	53	1.7%	122	4.0%
	141.15	4,249	3,750	88.3%	282	6.6%	47	1.1%	170	4.0%
Jefferson	120.24	4,988	4,727	94.8%	82	1.6%	27	0.5%	152	3.0%
	120.35	5,294	5,058	95.5%	81	1.5%	22	0.4%	133	2.5%
	120.59	3,245	2,961	91.2%	79	2.4%	36	1.1%	169	5.2%
	120.60	3,336	3,076	92.2%	53	1.6%	29	0.9%	178	5.3%
Subtotals	17 Tracts	45,545	59,512	91.6%	2,013	3.1%	706	1.1%	2,731	4.2%
Arapahoe County Tracts (8)		26,450	24,627	93.1%	615	2.3%	257	1.0%	951	3.6%
Douglas County Tracts (14)		54,240	48,174	88.8%	2,693	5.0%	876	1.6%	2,497	4.6%
Jefferson County Tracts (8)		33,775	31,508	93.3%	629	1.9%	213	0.6%	1,425	4.2%
Study Area Total (30 Tracts)		114,465	104,309	91.1%	3,927	3.4%	1,346	1.2%	4,873	4.3%
All of Arapahoe County		572,003	415,910	72.7%	29,077	5.1%	58,107	10.2%	68,909	12.0%
All of Douglas County		285,465	257,598	90.2%	10,716	3.8%	3,476	1.2%	13,675	4.8%
All of Jefferson County		534,543	472,694	88.4%	14,037	2.6%	5,667	1.1%	42,145	7.9%
Three-County Total		1,392,011	1,146,202	82.3%	53,830	3.9%	67,250	4.8%	124,729	9.0%
State of Colorado		5,029,196	4,089,202	81.3%	139,028	2.8%	201,737	4.0%	599,229	11.9%

**Table A-1 (continued)**  
**Racial Populations from 2010 Census (Detail for “Other or Combinations”)**

County	Tracts that Abut or Include C-470	Population	Native American	Per-Cent	Pacific Islander	Per-cent	Some Other Race	Per-cent	Two or More Races	Per-cent
Arapahoe	56.22	2,326	7	0.3%	0	0.0%	30	1.3%	40	1.7%
	56.34	2,959	14	0.5%	2	0.1%	25	0.8%	36	1.2%
Douglas	141.07	3,718	14	0.4%	0	0.0%	38	1.0%	130	3.5%
	141.10	5,233	14	0.3%	4	0.1%	107	2.0%	129	2.5%
	141.14	3,678	18	0.5%	0	0.0%	58	1.6%	72	2.0%
	141.16	4,440	8	0.2%	2	0.0%	82	1.8%	111	2.5%
	141.31	3,283	13	0.4%	1	0.0%	28	0.9%	65	2.0%
	141.38	2,902	14	0.5%	0	0.0%	54	1.9%	85	2.9%
	141.39	4,052	26	0.6%	0	0.0%	53	1.3%	69	1.7%
Jefferson	120.36	3,707	6	0.2%	1	0.0%	48	1.3%	69	1.9%
	120.53	3,794	25	0.7%	2	0.1%	58	1.5%	86	2.3%
	120.55	3,706	23	0.6%	2	0.1%	88	2.4%	95	2.6%
	120.57	5,705	24	0.4%	4	0.1%	98	1.7%	164	2.9%
Subtotals	13 Tracts	49,503	206	0.4%	18	0.0%	767	1.5%	1,151	2.3%

County	Tracts Farther from C-470	Population	Native American	Per-Cent	Pacific Islander	Per-cent	Some Other Race	Per-Cent	Two or More Races	Per-cent
Arapahoe	56.25	2,899	10	0.3%	3	0.1%	28	1.0%	81	2.8%
	56.30	5,322	31	0.6%	3	0.1%	55	1.0%	112	2.1%
	56.31	3,028	10	0.3%	0	0.0%	35	1.2%	58	1.9%
	56.32	3,189	13	0.4%	1	0.0%	35	1.1%	60	1.9%
	67.05	4,979	6	0.1%	1	0.0%	55	1.1%	159	3.2%
	67.08	1,748	2	0.1%	0	0.0%	2	0.1%	37	2.1%
Douglas	141.01	6,242	49	0.8%	1	0.0%	164	2.6%	224	3.6%
	141.07	2,410	6	0.2%	3	0.1%	65	2.7%	91	3.8%
	141.08	4,894	6	0.1%	0	0.0%	75	1.5%	117	2.4%
	141.09	2,259	10	0.4%	0	0.0%	22	1.0%	29	1.3%
	141.12	3,834	9	0.2%	0	0.0%	46	1.2%	93	2.4%
	141.13	3,046	12	0.4%	2	0.1%	50	1.6%	58	1.9%
	141.15	4,249	15	0.4%	3	0.1%	57	1.3%	95	2.2%
Jefferson	120.24	4,988	17	0.3%	3	0.1%	29	0.6%	103	2.1%
	120.35	5,294	9	0.2%	3	0.1%	27	0.5%	94	1.8%
	120.59	3,245	19	0.6%	2	0.1%	77	2.4%	71	2.2%
	120.60	3,336	14	0.4%	0	0.0%	63	1.9%	101	3.0%
Subtotals	17 Tracts	45,545	238	0.4%	25	0.0%	885	1.4%	1,583	2.4%
Arapahoe County Tracts (8)		26,450	93	0.4%	10	0.0%	265	1.0%	583	2.2%
Douglas County Tracts (14)		54,240	214	0.4%	16	0.0%	899	1.7%	1,368	2.5%
Jefferson County Tracts (8)		33,775	137	0.4%	17	0.1%	488	1.4%	783	2.3%
Study Area Total (30 Tracts)		114,465	444	0.4%	43	0.0%	1,652	1.4%	2,744	2.4%

All of Arapahoe County	572,003	4,963	0.9%	1,140	0.2%	39,048	1.0%	24,357	4.3%
All of Douglas County	285,465	1,183	0.4%	192	0.1%	4,894	1.7%	7,406	2.6%
All of Jefferson County	534,543	4,717	0.9%	457	0.1%	22,245	4.2%	14,546	2.7%
Three-County Total	1,392,011	10,863	0.8%	1,789	0.1%	66,187	4.8%	46,309	3.3%
State of Colorado	5,029,196	56,010	1.1%	6,623	0.1%	364,140	7.2%	172,456	3.4%

**Table A-2**  
**Hispanic Ethnicity from 2010 Census SF-1, Table P2**

County	Tracts that Abut or Include C-470	Population	Hispanic or Latino	% Hispanic or Latino
Arapahoe	56.22	2,326	111	4.8%
	56.34	2,959	119	4.0%
Douglas	141.07	3,718	217	5.8%
	141.10	5,233	299	5.7%
	141.14	3,678	197	5.4%
	141.16	4,440	334	7.5%
	141.31	3,283	147	4.5%
	141.38	2,902	239	8.2%
	141.39	4,052	271	6.7%
Jefferson	120.36	3,707	231	6.2%
	120.53	3,794	359	9.5%
	120.55	3,706	357	9.6%
	120.57	5,705	493	8.6%
Subtotals	13 Tracts	49,503	3,374	6.8%

County	Tracts Farther from C-470	Population	Hispanic or Latino	% Hispanic or Latino
Arapahoe	56.25	2,899	229	7.9%
	56.30	5,322	315	5.9%
	56.31	3,028	192	6.3%
	56.32	3,189	207	6.5%
	67.05	4,979	284	5.7%
	67.08	1,748	58	3.3%
Douglas	141.01	6,242	661	10.6%
	141.07	2,410	259	10.7%
	141.08	4,894	338	6.9%
	141.09	2,259	115	5.1%
	141.12	3,834	261	6.8%
	141.13	3,046	135	4.4%
	141.15	4,249	201	4.7%
Jefferson	120.24	4,988	322	6.5%
	120.35	5,294	199	3.8%
	120.59	3,245	324	10.0%
	120.60	3,336	369	11.1%
Subtotals	17 Tracts	45,545	3,242	7.1%

Arapahoe County Tracts (8)	26,450	1,515	5.7%
Douglas County Tracts (14)	54,240	3,674	6.8%
Jefferson County Tracts (8)	33,775	2,654	7.9%
Study Area Total (30 Tracts)	114,465	7,843	6.9%
All of Arapahoe County	572,003	105,522	18.4%
All of Douglas County	285,465	21,392	7.5%
All of Jefferson County	534,543	76,445	14.3%
Three-County Total	1,392,011	203,359	14.6%
State of Colorado	5,029,196	1,038,687	20.7%

**Table A-3**  
**Total Minorities from 2010 Census SF-1, Table P2**

County	Tracts that Abut or Include C-470	Population	White Alone Not Hispanic	All Others (Minority)	% Non-Minority	% Minority
Arapahoe	56.22	2,326	2,101	225	90.3%	9.7%
	56.34	2,959	2,741	218	92.6%	7.4%
Douglas	141.07	3,718	3,237	481	87.1%	12.9%
	141.10	5,233	4,464	769	85.3%	14.7%
	141.14	3,678	3,297	381	89.6%	10.4%
	141.16	4,440	3,478	962	78.3%	21.7%
	141.31	3,283	2,899	384	88.3%	11.7%
	141.38	2,902	2,316	586	79.8%	20.2%
	141.39	4,052	3,317	735	81.9%	18.1%
Jefferson	120.36	3,707	3,304	403	89.1%	10.9%
	120.53	3,794	3,296	498	86.9%	13.1%
	120.55	3,706	3,177	529	85.7%	14.3%
	120.57	5,705	4,926	779	86.3%	13.7%
Subtotals	17 Tracts	49,503	42,553	6,950	86.0%	14.0%

County	Tracts Farther from C-470	Population	White Alone Not Hispanic	All Others (Minority)	% Non-Minority	% Minority
Arapahoe	56.25	2,899	2,505	394	86.4%	13.6%
	56.30	5,322	4,727	595	88.8%	11.2%
	56.31	3,028	2,693	335	88.9%	11.1%
	56.32	3,189	2,819	370	88.4%	11.6%
	67.05	4,979	4,350	629	87.4%	12.6%
	67.08	1,748	1,622	126	92.8%	7.2%
Douglas	141.01	6,242	5,097	1,145	81.7%	18.3%
	141.07	2,410	1,799	611	74.6%	23.4%
	141.08	4,894	4,321	573	88.3%	11.7%
	141.09	2,259	2,044	215	90.5%	9.5%
	141.12	3,834	3,279	555	85.5%	14.5%
	141.13	3,046	2,584	462	84.8%	15.2%
	141.15	4,249	3,880	369	91.3%	
Jefferson	120.24	4,988	4,464	524	89.5%	10.5%
	120.35	5,294	4,903	391	92.6%	7.4%
	120.59	3,245	2,743	502	84.5%	15.5%
	120.60	3,336	2,807	529	84.1%	15.9%
Subtotals	17 Tracts	45,545	56,637	8,325	87.2%	12.8%
Arapahoe County Tracts (8)		26,450	23,558	2,892	89.1%	10.9%
Douglas County Tracts (14)		54,240	46,012	8,228	84.8%	15.2%
Jefferson County Tracts (8)		33,775	29,260	4,155	87.7%	12.3%
Study Area Total (30 Tracts)		114,465	99,190	15,275	86.7%	13.3%
All of Arapahoe County		572,003	450,423	121,580	78.7%	21.3%
All of Douglas County		285,465	243,465	42,168	85.2%	14.8%
All of Jefferson County		534,543	427,160	107,383	79.9%	20.1%
Three-County Total		1,392,011	1,120,880	271,131	80.5%	19.5%
State of Colorado		5,029,196	3,520,793	1,508,403	70.0%	30.0%

**Table A-4**  
**Linguistically Isolated Households from American Community Survey**

County	Tracts that Abut or Include C-470	House- holds	Language Spoken at Home			Percentage of Households		
			Spanish	Other	Total	Spanish	Other	Total
Arapahoe	Tract 56.22	1,086	0	0	0	0.0%	0.0%	0.0%
	Tract 56.34	1,448	0	21	21	0.0%	1.5%	1.5%
Douglas	Tract 141.07	1,327	0	0	0	0.0%	0.0%	0.0%
	Tract 141.10	2,257	13	51	64	0.6%	2.3%	2.8%
	Tract 141.14	1,397	19	0	19	1.4%	0.0%	1.4%
	Tract 141.16	1,932	0	0	0	0.0%	0.0%	0.0%
	Tract 141.31	1,571	0	11	11	0.0%	0.7%	0.7%
	Tract 141.38	1,849	0	33	33	0.0%	1.8%	1.8%
	Tract 141.39	1,527	0	53	53	0.0%	3.5%	3.5%
Jefferson	Tract 120.36	1,374	0	0	0	0.0%	0.0%	0.0%
	Tract 120.53	1,439	8	0	8	0.6%	0.0%	0.6%
	Tract 120.55	1,578	0	0	0	0.0%	0.0%	0.0%
	Tract 120.57	2,562	11	77	88	0.4%	3.0%	3.4%
Subtotals	13 Tracts	20,261	51	246	297	0.2%	1.2%	1.4%

County	Tracts Farther from C-470	House- holds	Language Spoken at Home			Percentage of Households		
			Spanish	Other	Total	Spanish	Other	Total
Arapahoe	Tract 56.25	1,083	0	15	15	0.0%	1.4%	1.4%
	Tract 56.30	2,260	0	22	22	0.0%	1.0%	1.0%
	Tract 56.31	1,186	0	11	11	0.0%	0.9%	0.9%
	Tract 56.32	1,148	0	10	10	0.0%	0.9%	0.9%
	Tract 67.05	545	0	0	0	0.0%	0.0%	0.0%
	Tract 67.08	1,838	8	8	16	0.4%	0.4%	0.8%
Douglas	Tract 140.01	2,521	21	13	24	0.8%	0.5%	1.3%
	Tract 140.07	923	24	9	33	2.6%	1.0%	3.6%
	Tract 141.08	1,834	0	31	31	0.0%	1.7%	1.7%
	Tract 141.09	808	0	0	0	0.0%	0.0%	0.0%
	Tract 141.12	1,466	31	0	31	2.1%	0.0%	2.1%
	Tract 141.13	1,035	0	16	16	0.0%	1.5%	1.5%
	Tract 141.15	1,599	0	57	57	0.0%	3.6%	3.6%
Jefferson	Tract 120.24	1,932	0	13	13	0.0%	0.7%	0.7%
	Tract 120.35	1,839	0	0	0	0.0%	0.0%	0.0%
	Tract 120.59	1,175	0	0	0	0.0%	0.0%	0.0%
	Tract 120.60	1,415	82	0	82	5.8%	0.0%	5.8%
Subtotals	17 Tracts	18,385	166	205	371	0.7%	0.8%	1.5%
Arapahoe County Tracts (8)		10,594	8	87	95	0.1%	0.8%	0.9%
Douglas County Tracts (14)		22,046	108	274	382	0.5%	1.2%	1.7%
Jefferson County Tracts (8)		13,314	101	90	191	0.8%	0.7%	1.4%
Study Area (30 Tracts)		45,954	217	383	600	0.5%	0.8%	1.3%
All of Arapahoe County		221,136	7,420	5,227	12,647	3.4%	2.4%	5.7%
All of Douglas County		100,795	4,713	6,363	11,076	4.7%	6.3%	11.0%
All of Jefferson County		217,763	1,703	1,775	3,478	0.8%	0.8%	1.6%
Three-County Total		539,694	13,836	15,485	27,101	2.6%	2.9%	5.4%

**Table A-5**  
**Low-Income Households**

County Threshold	Tracts that Abut or Include C-470	Households	Low-Income Households		% of Households	
			< \$20,000	< \$25,000	< \$20,000	< \$25,000
Arapahoe \$19,946	56.22	1,086	53	N/A	4.9%	N/A
	56.34	1,448	214	N/A	14.8%	N/A
Douglas \$20,557	141.07	1,327	50	64	3.8%	4.8%
	141.10	2,257	91	203	4.0%	9.0%
	141.14	1,397	143	157	10.2%	11.2%
	141.16	1,932	143	196	7.4%	10.1%
	141.31	1,571	30	86	1.9%	5.5%
	141.38	1,849	147	188	8.0%	10.2%
	141.39	1,527	67	67	4.4%	4.4%
Jefferson \$19,687	120.36	1,374	50	N/A	3.6%	N/A
	120.53	1,439	76	N/A	5.3%	N/A
	120.55	1,578	102	N/A	6.5%	N/A
	120.57	2,562	230	N/A	9.0%	N/A
Subtotals	13 Tracts	20,261	1,343	961	6.6%	4.7%

County Threshold	Tracts Farther from C-470	Households	Number with Income		% of Households	
			< \$20,000	< \$25,000	< \$20,000	< \$25,000
Arapahoe \$19,946	56.25	1,083	94	N/A	8.7%	N/A
	56.30	2,260	212	N/A	9.4%	N/A
	56.31	1,186	70	N/A	5.9%	N/A
	56.32	1,148	15	N/A	1.3%	N/A
	67.05	545	13	N/A	2.4%	N/A
	67.08	1,838	97	N/A	5.3%	N/A
Douglas \$20,557	140.01	2,521	138	214	5.5%	8.5%
	140.07	923	117	141	12.7%	15.3%
	141.08	1,834	29	29	1.6%	1.6%
	141.09	808	57	57	7.1%	7.1%
	141.12	1,466	11	40	0.8%	2.7%
	141.13	1,035	34	34	3.3%	3.3%
	141.15	1,599	43	76	2.7%	4.8%
Jefferson \$19,687	120.24	1,932	84	N/A	4.3%	N/A
	120.35	1,839	55	N/A	3.0%	N/A
	120.59	1,175	45	N/A	3.8%	N/A
	120.60	1,415	190	N/A	13.4%	N/A
Subtotals	17 Tracts	24,607	900	591	3.4%	2.4%
Arapahoe County Tracts (8)		10,594	768	N/A	7.2%	N/A
Douglas County Tracts (14)		22,046	1,100	1,552	5.0%	7.0%
Jefferson County Tracts (8)		13,314	832	N/A	6.2%	N/A
Study Area Total (30 Tracts)		45,954	2,700	3,152	5.9%	6.9%
All of Arapahoe County		221,136	1,615	N/A	5.5%	N/A
All of Douglas County (range)		100,795	4,713	6,363	4.7%	6.3%
All of Jefferson County		217,763	24,371	N/A	11.2%	N/A
Three-County Total (range)		539,694	30,699	32,349	8.8%	9.3%

Note: For Douglas County only, low-income households include those under \$20,000 income plus a fraction of those in the next higher category (under \$25,000).



**Table A-6**  
**Subsidized Lunch Eligibility for 13 Area Schools in the C-470 Study Area,**  
**FY 2003 and FY 2011**

Source: U.S. Department of Education, National Center for Education Statistics

County	School	Enrolled Students	Students Eligible for Subsidy			% of Enrolled Students		
			Free	Reduced	Total	Free	Reduced	Total
Arapahoe	Powell Middle School	980	10	14	24	1.0%	1.4%	2.4%
Douglas	Acres Green Elementary	612	13	14	27	2.1%	2.3%	4.4%
	Chaparral High School	1,564	14	12	26	0.9%	0.8%	1.7%
	Cougar Run Elementary	643	10	8	18	1.6%	1.2%	2.8%
	Highlands Ranch H.S.	1,834	3	10	13	0.2%	0.5%	0.7%
	Northridge Elementary	623	16	13	29	2.6%	2.1%	4.7%
	Roxborough Elementary	692	13	10	23	1.9%	1.4%	3.3%
	Sand Creek Elementary	500	11	9	20	2.2%	1.8%	4.0%
Jefferson	Collegiate Charter Acad.	532	19	21	40	3.6%	2.9%	7.5%
	Columbine High School	1,795	36	49	75	2.0%	2.7%	4.7%
	Columbine Hills Elem.	512	23	29	52	4.5%	5.7%	10.2%
	Coronado Elementary	557	20	18	38	3.6%	3.2%	6.8%
	Mortensen Elementary	388	14	18	32	3.6%	4.6%	8.2%
Totals for 2002-2003		11,232	202	225	417	1.8%	2.0%	3.7%

County	School	Enrolled Students	Students Eligible for Subsidy			% of Enrolled Students		
			Free	Reduced	Total	Free	Reduced	Total
Arapahoe	Powell Middle School	860	70	22	92	8.1%	2.6%	10.7%
Douglas	Acres Green Elementary	689	91	30	121	13.2%	4.4%	16.6%
	Chaparral High School	568	38	17	55	6.7%	3.0%	9.7%
	Cougar Run Elementary	2,077	132	46	178	6.4%	2.2%	8.6%
	Highlands Ranch H.S.	1,742	99	41	140	5.7%	2.3%	8.0%
	Northridge Elementary	713	62	17	79	8.7%	2.4%	11.1%
	Roxborough Elementary	448	22	7	29	4.9%	1.6%	6.5%
	Sand Creek Elementary	599	51	16	67	8.5%	2.7%	11.2%
Jefferson	Collegiate Charter Acad.	499	46	32	78	9.2%	6.4%	15.6%
	Columbine High School	1,622	240	50	290	14.8%	3.1%	17.9%
	Columbine Hills Elem.	433	117	21	138	27.0%	4.8%	31.8%
	Coronado Elementary	563	82	11	93	14.6%	2.0%	16.6%
	Mortensen Elementary	446	74	25	99	16.6%	5.6%	22.2%
Totals for 2010-2011		11,259	1,124	335	1,459	10.0%	3.0%	13.0%

Change, FY 2003 to FY 2011	27	922	110	1,042
% Change, FY 2003 to FY 2011	0.2%	456%	49%	250%

Note: The 456% increase in free school lunch eligibility over an eight-year period may be due to structural changes in program eligibility, rather than reflecting rapid short-term demographic change in the study area. Eligibility increased at all 13 schools, not just in isolated locations. Also, the FY 2003 data reflect a relatively prosperous economic time, while the FY 2011 data reflect a time of slow recovery from a major national recession.